# Alternate Energy - Related Uses on the Outer Continental Shelf

**Regulation Identifier Number (RIN)**

**‘‘1010–AD30’’**

**Submitted by:** Airtricity Inc.

**Submitted to:** Minerals Management Service

**Date:** February 2006

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## Submitter Information


**First Name:** Declan

**Last Name:** Flanagan

**Mailing Address:** Airtricity, Inc.,

401 North Michigan Avenue,

Suite 3020,

Chicago,

IL 60611.

**Country:** United States of America.

**Organization Name**: Airtricity, Inc.

## Foreword

Airtricity is pleased to submit its response to the Minerals Management Service's recent ANoPR seeking comments on the development of a regulatory program to implement Section 388 of the Energy Policy Act of 2005 – Alternate Energy-Related Uses on the Outer Continental Shelf (OCS).

Airtricity is a world leading renewable energy company. As an integrated utility, the company is both a generator and supplier of green electricity, currently supplying renewable electricity to over 50,000 commercial customers in the Republic of Ireland and Northern Ireland. It is actively developing wind farms in the United States as well as the Republic of Ireland, Northern Ireland, Scotland, England, Wales and China and has wind farms operating in Ireland and Scotland. In the last year, Airtricity has signed a number of high profile deals in the U.S. which will accelerate its continued development in the United States through 2006, 2007 and 2008.

Through partnerships with leading international companies such as GE Energy, Airtricity is developing what will be the world's second largest offshore wind farm on the Arklow sandbank, located off the east coast of Ireland. Airtricity, with its partner Fluor, have submitted an application for development consent for the construction of a 500 MW offshore wind farm to be located in the Thames Estuary, off the coast of Suffolk. The joint venture was awarded a lease option agreement from The Crown Estate in December 2003, one of 15 projects awarded by The Crown Estate as part of the second round competition for UK offshore wind farm developments and one of four awarded in the Thames Estuary.

Airtricity is of the opinion that a competitive process that grants concessions to developers on a phased basis is the most appropriate vehicle for encouraging wind farm projects on the Outer Continental Shelf. Airtricity suggests that the MMS study the UK Crown Estate permitting process in the formulation of its regulatory process.

There are a number of key points worthy of attention. Experience has shown that each wind farm site contains a range of environmental impacts and benefits. As such, analysis of impacts and benefits is best carried out individually for each site. This also avoids the possibility of lengthy delay while an extensive and general assessment of impacts and benefits for a wide area is carried out. The wind industry has achieved a certain momentum in the last number of years and

it is important to use that momentum to full advantage without delay. Airtricity would also like to see robust mechanisms for the withdrawal of rights from developers where no significant effort to progress a project has been made.

Equally, it is important that the regulatory process that is decided upon does not contain provisions or rules that inhibit development. It should be possible to finance projects through loans and equity based on the leases, payment schemes, rules and conditions of the process. Any aspect of the regulatory regime that places unnecessary barriers in the path of developers who wish to finance projects in this manner should be avoided.

One of the tasks that MMS has undertaken is to engage in a digital mapping exercise. Airtricity would urge them to progress this exercise as rapidly a possible. Accurate and comprehensive data aids site selection exercises and is a significant boost to development efforts.

Airtricity looks forward to working with the MMS to develop the full potential of the Outer Continental Shelf with renewable, green and secure sources of electricity.

Sincerely,

Declan Flanagan

CEO Airtricity, Inc.

## Executive Summary

The 2005 Energy Bill was signed into law by President Bush on August 8th 2005. Section 388 of this Bill granted the Minerals Management Services (MMS) the right to grant leases, easements or right-of ways to renewable energy projects in federal territories on the Outer Continental Shelf (OCS). The MMS also has the responsibility of acting as lead agency during this permitting process and for monitoring and regulating facilities installed as a result.

On the 30th December 2005, the Mineral Management Services issued an Advanced Notice of Proposed Rulemaking (ANoPR), which sought to gather comments on the proposed process from all interested parties. The ANoPR raised a number of general issues as well as asking specific questions in five program areas as follows:

1. Access to OCS lands and resources
2. Environmental information, management and compliance
3. Operational activities
4. Payments and revenues
5. Coordination and consultation

This document forms the basis of Airtricity's response to the MMS. The structure of the response follows that of the ANoPR with a separate section for each of the five program areas. The general issues raised and specific questions asked in the ANoPR have been reproduced to aid review of the information provided. In addition, the numbering system utilized by MMS in its document has been retained.

Airtricity is a world leading renewable energy company, developing and operating wind farms in the United States, Ireland, Scotland, England and Wales. It has developed Ireland's first offshore wind farm and has submitted an application for consent for its Greater Gabbard project off the coast of Suffolk, England.

Airtricity would like to see MMS develop a permitting program that grants phased access rights to OCS lands to developers on the basis of their proven track record and financial ability to develop

projects to their full potential. It is crucial to build on the current level of momentum in the industry by creating a process that allows for continuous applications and avoids creating a stop-start process through a system of application rounds. This will create confidence in the industry and allow easier financing of projects and a greater degree of planning in the supply chain.

The lease awarded should be designed to ease project finance difficulties encountered in other regimes. Lease conditions which could create difficulty for developers include provisions which give oil and gas discoveries precedence over constructed wind farms.

Airtricity would recommend the Crown Estate process, which operates in the United Kingdom, as a model for the MMS to consider during its rule making process, in conjunction with the points made above and throughout this document.

**ACCESS TO OCS LANDS AND RESOURCES**

Airtricity would like to see a process that grants access rights on a phased basis and allows site investigation activities to commence as early as possible in the process. This should include the erection of meteorological masts on site as this helps to reduce project risk and allows more informed site design.

It is important that the process does not unnecessarily hinder developers attempting to finance projects through loans or equity. Particular care should be taken with the drafting of the lease conditions, as these can have a significant impact on the project success. Leases should avoid any clauses which permit termination of the project for reasons outside of the control of the developer, e.g. the discovery of oil or gas deposits within the site boundary, as this is an unacceptable risk for lending institutions to consider. Leases should also allow flexibility in relation to assignment of rights and phased development and construction and should give adequate access to the required amount of seabed. The terms of the lease should also include provisions to withdraw rights from developers who fail to progress their projects adequately.

A system similar to the leasing process that the MMS currently uses for oil and gas permitting would have certain disadvantages for the offshore wind industry. Leasing the OCS in blocks would place additional constraints on the site selection process and could result in potential sites not being fully developed because of the limits of the block dimensions. The aim of the regulatory process should be to ensure that the best developers are working on the best sites.

### ENVIRONMENTAL INFORMATION, MANAGEMENT AND COMPLIANCE

Wind farms provide a clean, indigenous, renewable and secure source of energy. They provide a viable alternative to the continued use of fossil fuels, which damage the environment through the emission of $CO_2$. Producing electricity by harnessing wind power has significant and immediate benefits for both the local and global environment. The local impacts of the infrastructure are tightly managed by developers such as Airtricity by implementing a rigorous Environmental Management System that prevents and controls impacts through a process of monitoring and mitigation.

### OPERATIONAL ACTIVITIES

Airtricity adheres to the British Wind Energy Association Health and Safety guidelines, as they provide detailed and comprehensive guidance in relation to developing, constructing and operating both on and offshore wind farm projects, in the absence of specific regulatory guidance.

Site specific environmental concerns identified during the EIS process are addressed and/or mitigated during construction and operations. Airtricity maintains continuous dialogue with all project stakeholders, including the statutory permitting agencies and local municipalities and residents to ensure compliance with regulatory requirements, minimization of unfavorable environmental impacts and environmental enhancements where appropriate.

Decommissioning of wind farms should be given due consideration during the consent, design, construction and operation stages. Very often decommissioning strategies are based on policies and procedures that currently cover decommissioning of oil and gas facilities.

### PAYMENTS AND REVENUES

Airtricity is not in favor of bonus bids for offshore renewable energy projects. Awarding access rights to the highest bidder will not ensure that the best developer is allowed to develop the best sites. Such a mechanism would eliminate fair competition as it discriminates against developers who wish to finance projects through debt. Bonus bids also serve to increase the capital required up front and therefore add to the development risk.

Similar arguments can be made against rental payment prior to actual production from the wind farm. Once production commences royalty charges should be payable based on the production levels of the wind farm, consistent with payment structures for onshore wind farms in the US.

**COORDINATION AND CONSULTATION**

This ANoPR is an excellent start to the process of establishing a program to develop the renewable energy potential of the Outer Continental Shelf. Airtricity believes in continuous consultation with all stakeholders throughout a project lifecycle, beginning as early as possible and including all of the possible stakeholders. A significant element of the process should be in line with the creation of an environmental impact statement.

The program should allow access to as broad a region as possible and should not restrict the focus to particular areas. Allowing developers to lead the site selection exercise should ensure that the best sites are chosen for the technology of their choice. It is likely to prove difficult to choose specific areas of the OCS that are suitable for all of the technologies currently available. Airtricity would, however, encourage the MMS to proceed with a digital mapping initiative as well as start to outline areas of the sea which are unsuitable for development such as military exercise areas and shipping lanes.

The permitting process for a large offshore wind farm development is always going to be an extensive and complicated undertaking. There would be significant benefits for all parties if MMS acted as lead agency for all aspects of proposed developments. This should include coordinating with other federal agencies such as the EPA, as well as with coastal states near proposed sites.

 

## Overview of Airtricity

Airtricity is a world leading renewable energy company founded in 1999. The company specialises in the development, construction, operation and long-term ownership of onshore and offshore wind farms and the generation/supply of green electricity. As an integrated utility, the company is both a generator and supplier of green electricity and currently supplies green electricity to commercial customers in both the Republic of Ireland and Northern Ireland. Airtricity operates in the United States, Ireland, Scotland, England and Wales and is exploring business possibilities in China. Its wind farm development pipeline worldwide exceeds 5000MW. The company was established in Ireland in 1999 when it purchased the business of Future Wind Partnership, an independent renewable energy company, which was established in January 1997. The company is 51% owned by NTR plc, an Irish developer/operator of public infrastructure (toll roads, waste/water and energy). The company's turnover for 2004 was €126.7 million. Turnover for 2005/2006 is expected to reach €240 million. Airtricity has completed four equity fund raising rounds to date, raising in excess of €130 million. The company is valued at €349 million as of March 2005 and currently employs in excess of 250 people worldwide.

Airtricity's founding members came together from the energy, engineering, academic, finance and legal worlds to form a company dedicated to the promotion of wind as the energy source of the future. The Chief Executive of Airtricity is Dr. Eddie O'Connor, an innovator and veteran of the energy business. Under his leadership, Airtricity has formed relationships with key consultants, advisors and industry groups including the American Wind Energy Association and the European Wind Energy Association (EWEA) and is active in setting renewables policy through its active participation in such groups. Dr. O'Connor was appointed Energy Policy Leader by "Scientific America" magazine for his offshore renewable energy initiatives.

Airtricity established an office in the US in April 2003 and has successfully created a platform from which to grow a significant development business. Airtricity's U.S. headquarters is in Chicago and it has development offices located in Albany, Dallas and Austin. Airtricity sees major growth potential in the U.S. market and plans to be a major force in the U.S. wind industry. It recently announced a further strengthening of its U.S. operations by completing the acquisition of Renewable Generation Inc (RGI) an Austin, Texas based wind energy developer in a cash and stock deal. As a result of this expansion it has over 3,100 MW in the development pipeline.

Airtricity has a number of successful co-development partnerships with industry players worldwide and continues to seek mutually beneficial partnership opportunities to expand its wind farm portfolio.

Airtricity has been to the forefront of the development of offshore wind farms through its Arklow Bank Project, which is now in operation in the Irish Sea. In May 2005, together with its partners GE and Acciona Energia (formerly EHN), Airtricity launched the first phase (25MW) of the Project. Airtricity holds a Foreshore Lease for what will ultimately be a 520MW wind farm at the Arklow Bank.

In December 2003, Airtricity together with its Joint Venture partner, Fluor, was awarded a lease from The Crown Estate to build and operate a 500MW offshore wind farm at Greater Gabbard in the UK. In October 2005, the company submitted an application for consent - the first offshore wind farm to seek consent outside UK territorial waters. Subject to receipt of consent, it is expected that the first turbines will be operational by the end of 2008.

Building a supply business and having a substantial customer base differentiates Airtricity from other developers and has been key to enabling Airtricity to build wind farms in the very challenging market system in Ireland.

Airtricity has recently announced details of a number of groundbreaking deals for wind turbines at a time of acute worldwide turbine shortage. Airtricity have placed an order for 125MW of Siemens 2.3MW turbines for use in 2006 in their McDonald's Ranch Phase I/Forest Creek Project. They have also signed a deal with Gamesa to use 90MW of Gamesa's G87 turbines for phase II of the same project in 2006. A further deal with Siemens has guaranteed the purchase of 75MW of their 2.3MW turbines for 2007 with negotiations ongoing for the purchase of another 50MW for the same year. Last month a deal was announced which will see Airtricity purchase 250MW of turbines from Mitsubishi Power Systems for use in 2007 – the largest order for turbines ever placed with Mitsubishi Power Systems.

Airtricity operates in a sector experiencing rapid growth. The requirements of various international agreements such as the Kyoto agreement will continue to be a major driver of growth into the future. However, other factors are becoming more and more important, such as increased world-wide electricity demand coupled with advances in wind turbine technology as well as concerns regarding strategic security of fossil fuels in terms of availability and price volatility.

Airtricity believes it can play a significant role in the reduction of carbon dioxide emissions on a national and international level. The company's objective is to continue to build wind farms, on and offshore, across a number of countries worldwide. Each year, the energy generated from Airtricity's wind farms prevents the release of over 750,000 tonnes of $CO_2$ from entering into the atmosphere – that's equivalent to taking over 170,000 cars off the road per year.

***Airtricity's vision for the future is to see a world with no dependency on fossil fuel generation. The company's mission is to be a world leader in renewable electricity construction and generation and supply to wholesale and retail markets.***

With a proven track record in onshore and offshore wind farm development Airtricity would be pleased to make representatives available to the MMS to further discuss issues that may arise during the rule making process. The experience gained in the European market puts Airtricity in a unique position to offer input to the Minerals Management Services and it looks forward to building a successful relationship with the agency.

## Other regulatory regimes

**Are there regulatory regimes, either in the U.S. or abroad, that address similar or related issues that should be reviewed or considered as MMS moves forward with the rulemaking process?**

Airtricity has offshore wind farm projects in the Republic of Ireland and the United Kingdom as well as a large number of onshore projects in many different countries, including the United States. Developing these assets has given Airtricity considerable experience with a wide variety of schemes and processes for permitting and encouraging wind farm development. It is the considered opinion of Airtricity that an effective regulatory regime for permitting offshore renewable energy projects in a competitive, timely and fair manner should award phased access rights to developers on the basis of competency and project quality. Airtricity recommend that the MMS study the structure of The Crown Estate process, which operates in the United Kingdom, in conjunction with the comments made here, during its current rule making process.

The Crown Estate Act 1961 establishes the Crown Estate as the landowner of the seabed and areas of foreshore and its permission is required before any structure or cable can be placed on the seabed or foreshore. The Crown Estate announced Round One of UK offshore wind farm development in December 2000 and received a substantial response from developers. To date, 12 of the 18 projects that pre-qualified have gained all the necessary statutory consents to enable construction and operation.

Round Two was announced in July 2003 and is described in detail below. In total, 27GW of projects were proposed and 7.2GW were awarded Agreements to Lease. Combining the results of Round One and Round Two, the Crown Estate process has far exceeded the targets initially set by the UK government.

There are a number of areas where Airtricity feels the MMS can build on the experience gained in the United Kingdom to create a more efficient and streamlined process. This includes introducing a process that allows developers to apply for permits on a continuous basis without having to wait for a formal round of applications to be announced. This would eliminate the stop-start nature of the UK process and reap benefits for the authorities, the developers and indeed the supply chain who can find it difficult to predict levels of activity.

## Experiences in the United Kingdom:

Airtricity participated in Round 2 of the Crown Estate process and was awarded an agreement to lease for its Greater Gabbard project. The stages that were involved in tendering for the rights to develop this project are described below.

**1) Prequalification:** parties interested in developing offshore wind farm sites in UK waters were requested to register their interest in the form of a 10-page document detailing the scale and location of intended projects as well as a short Business Development Plan. Parties that successfully registered were then invited to attend a seminar that gave further details of the process.

**2) Tender Process:** The Crown Estate issued the tender documentation on the 15th July 2003. Stage 1 required developers to submit details of their proposed project location – developers were not limited to the sites they identified in their initial prequalification document. Stage 2 required the submission of a completed tender before the 15th October 2003.

**3) Assessment:** The tenders were assessed based on the following factors:

- **Tenderer:**

  Applicants were required to satisfy the Crown Estate that they possessed the required experience and expertise to specify, procure, install, operate and maintain a wind farm of the appropriate scale. The applicant was to give details of previous projects that it has developed and built.

  In addition, each applicant was required to offer proof of their ability to finance the project through the consents stage with specific levels of board commitment to the project depending on the area of the proposed development. Annual reports and audited accounts were to accompany the tender as well as details of any significant events or announcements.

- **Project Development**

This section of the tender contained details of the proposed site including size, location, proposed power output, construction phases and proposed cable route. Information about the onsite meteorological and oceanographic conditions, bathymetry, seabed conditions, geophysical and geotechnical surveys was also to be included.

The applicant was also requested to include baseline environmental data not limited to benthic habitats, inter-tidal habitats, fish and benthos, commercial fisheries, marine mammals, birds, coastal processes, marine archaeology, aesthetic impacts and cumulative impacts. Additionally the applicant was asked to provide an assessment of relevant stakeholder impacts and concerns and their plan for consulting and communicating with both stakeholders and local communities.

- **Business Development Plan**

The Business Development Plan was regarded as a key element of the tender and accordingly was judged to have high weighting during the assessment process. The commitments made in this part of the tender were included in the lease documents. The elements included were a financial, consents, construction and operational plan.

The Financial Plan was intended to satisfy the Crown Estate that the tenderer had a sound financial plan that would allow it to carry the project from consents stage through to construction, commissioning, operation, maintenance and decommissioning. A breakdown of the costs and an assessment of the risks attached to each stage were to be included.

The Consents Plan included timelines for gaining consent for and erecting the meteorological mast and equipment, completing the Environmental Impact Assessment, applying for statutory consents for the project and commencing construction. Furthermore the applicant was asked to provide details of the Environmental Management System, the community consultation plan and commitments to participating in collaborative efforts with other developers.

The Construction Plan identified the applicant's plans for the construction of the project including installation, foundation design, procurement of turbine components and connection to the electricity grid.

The Operational Plan was an important part of the tender and was to include details of the tenderer's intentions with respect to maintenance and contingency planning as well as details of options considered for turbine replacement during the term of the lease.

- **Decommissioning Plan**

This section of the tender required the tenderer to highlight its decommissioning plans to reassure the Crown Estate that the process had been fully considered. Discussion was to cover at a minimum assessment of risks, costing, timescale, financial proposals, environmental consideration and proposals for post decommissioning monitoring.

An expert panel assessed the project proposals and interviewed all project developers during November 2003 before projects were selected. The interview was structured around the elements of the project proposals as outlined above. Successful developers were notified in late December 2003.

**4) Award of agreement to lease:** Successful tenderers were offered an agreement to lease, which permits site investigations/exploration on the project site. The key components of the agreement to lease are outlined as follows:

- Requires a deposit to be made by the developer – the size of the deposit is dependent on the size of the site to a maximum of GB£500,000.
- Requires guarantors to ensure that the developer has the necessary financial backing.
- Sets out a period for site assessment during which an option to lease may be called on – typically this was seven years.
- Defines position of the site as described in the tender documentation, and ways of subsequently altering it.
- Defines need for tenant to obtain relevant consents for development before executing the option to lease.

- Requires data about proposed project power output
- Sets out timetable for the issue of a lease

At this stage the developer needs to acquire all other permits and consents from the relevant authorities. The Department of Trade and Industry acts as a "one-stop-shop" for these consenting exercises, coordinated through its Offshore Renewables Consents Unit (ORCU). Permits required depend on the site's precise location and the consenting route chosen by the developer. Key consents are required under the Electricity Act 1989, the Coast Protection Act 1949 and Food and Environmental Protection Act as well as other acts as required.

5) Award of lease.

- Defines term of the lease
- Defines tenant's right to use cables, develop the site etc
- Commits tenant to good and responsible construction and working methods
- Commits tenant to works timetable
- Commits tenant to rental payments
- Defines conditions for assigning the lease to another party
- Defines the financial standing required of the tenant, guarantors and any assignees
- Commits the tenant to obtaining insurance
- States a requirement for decommissioning
- Commits the landlord to protecting the tenant's interest
- Defines conditions for handing on the lease at the end
- Defined timelines.

## Comments on the Crown Estate process

The Crown Estate process has a number of significant advantages for both developers and regulators.

1. No set limits on amount of development size – although there were certain limits on the size of developments in Round One - these limits were removed for Round Two.

2. Developer led – sites were located and proposed by the developer.

3. Speed and efficiency – although there were some delays in issuing the tenders for Round Two, once the documents had been released the application process proceeded smoothly and quickly.

4. Revenue flow – from the outset, the definition of the revenue flows from the project were clear for the developer.

5. Encourages sensible site selection – restrictions on site selection were few. Developers were encouraged to locate the best site possible by making the site location a part of the tender assessment.

As outlined the process followed in the UK provides a good framework for selection and award of offshore wind farm sites. There are, however, some issues which the MMS could avoid through careful consideration at this stage. The Crown Estate process uses a system of rounds to govern when applicants can submit expressions of interest. This means the timing of sites receiving approval is unpredictable. This creates a lack of confidence in the market place and causes problems for supply chains in the industry. The situation is not helped by the lack of commitment to future rounds.

It is therefore the view of Airtricity that there should be no defined time period during which expressions of interest can be submitted. However once a project has been proposed there should be a defined timeline for submission of follow-up documentation, selection, interview and award. This will enable the US offshore wind industry to build a constant momentum to the benefit of both project developers and the supply side of the wind industry. This will also have a positive impact on potential investors and lenders in the wind sector.

A number of leases have been awarded in the Crown Estate process for projects which have not been advanced in a meaningful way by the developer. The leases contain options to terminate in such a situation but the Crown Estate has chosen not to exercise those options to date. This means there are a number of sites which are effectively being sterilized from development through the inaction of the developer and the lack of appropriate response from the authority.

Some aspects of the leases awarded made the projects very difficult to finance through loans from lending institutions. Some of these issues are discussed later in the section on access to OCS lands. Principal among the lease conditions that caused concern was a provision that discoveries of oil and gas within the project boundary could result in sections of the wind farm being decommissioned in order to extract the fossil fuel. This clause was later removed from the leases following discussion between various developers and the Crown Estate.

A number of participants felt there was a lack of transparency surrounding the assessment stage of the process. The feedback from the Crown Estate was limited irrespective of the results of the assessment. Although the results were not contested by any participant, it could be a possibility in the future. The MMS should aim to avoid any lack of clarity or ambiguity in the process in order to avoid delays arising from such contestations.

### Experiences in Ireland

The Department of Communications, Marine and Natural Resources in Ireland managed the permitting process for the only permitted/licensed Irish offshore wind farm to date, the Arklow Bank wind farm. Located about 10 kilometers off the coast of Arklow, the project was co-developed by Airtricity and GE Energy. Currently operated by GE Energy as a demonstration platform for its new 3.6MW offshore wind technology, the 25 megawatt project comprises 7 GE Energy 3.6-megawatts units – the largest wind turbines commercially installed at sea. A joint venture agreement has been reached between Airtricity and Acciona Energia of Spain for the purchase of Phase 1 of the project from GE Energy following successful completion of acceptance tests and for the co-development of the second phase of the project. Phase II is currently in the planning stage.

The Irish process bears many resemblances to the Crown Estate process. Developers applied for a foreshore license, which permits site exploration for a period of time. The foreshore license has to be followed by an application for a foreshore lease, which permits construction, a declaration of unsuitability for the site or a resignation of the rights granted under the foreshore license. There are two significant differences between the Irish and UK situations. Ireland has not experienced the same level of competition for sites as a result of a lack of government support for offshore renewable energy, difficulties obtaining grid connections and a challenging market environment. Airtricity has been the only wind farm developer to date who has displayed a commercial interest in an Irish site and who has moved forward to develop it. The other key difference was that

developers were encouraged to use their experience and expertise to identify their preferred sites and were not limited by the boundaries of areas identified by government officials, as was the case in the Crown Estate process.

The key elements of the process which were important to Airtricity in developing the project are as follows:

- All permitting was managed through one authority – the Department for Communications, Marine and Natural Resources.
- The Foreshore lease allowed development of the project in phases – this is more attractive commercially and reduces risk.
- The Foreshore lease also allowed sub-leasing of parts of the site so that each phase of the site could be developed independently through different commercial partnerships.

Airtricity would like to see similar elements present in the MMS regulatory process.

## Program area: Access to OCS Lands and Resources

### General issues:

**Please provide information on how MMS can best:**

**Provide access for resource and site assessment**

Quick adoption of a process similar to the Crown Estate process would allow developers to invest in detailed site investigation as rapidly as possible with some guarantees that their position on the potential site will be assured, should it prove suitable for development.

A key part of this process would be the erection of meteorological masts that are used to measure the wind speed and direction on the site at various heights. Erection of meteorological masts is an expensive and difficult undertaking and requires a substantial amount of specialist expertise and equipment. Without some level of guarantee that development rights over the project site are assured for a period of time, it will prove very difficult for developers to proceed with such expensive site investigation activities. Obtaining meteorological data early in the process and for as extended a period of time as possible (1 year minimum) reduces the risk for the developer, drives the site design and layout process and creates opportunity to maximize the use of the available resource and the financial return from the project. Therefore Airtricity feels that the agreement to lease documents should make detailed provision to allow the erection of meteorological equipment as soon as possible (other permits required which may be outside of MMS control).

The collation and management of relevant geospatial information would be a desirable development in the American market. Although much data is available from government agencies there is a significant overhead incurred in collating, re-engineering and assimilating the data from the many disparate sources it is available from. Mineral Management Services could play a role in implementing a secure, up-dated and accurate set of data that is available to developers throughout the process. The National Atlas could be regarded as a benchmark project.

**B. Issue the appropriate instrument (e.g., leases, easements, rights-of-way)**

As suggested in section A above, Airtricity suggests that the appropriate instrument is issued following prequalification, tendering and acquisition of all federal, state and municipal permissions and consents. An agreement to issue the appropriate instrument should be in place to encourage developer investment at the site development stage.

The details of the lease offered to developers can have a significant effect on the difficulty encountered in financing projects. The following paragraphs outline a number of issues, which arose during negotiations of both the Crown Estate lease in the UK and the Arklow Bank lease in Ireland.

Leases should not allow termination of the lease under conditions such as the discovery of oil and gas resources, particularly after construction has been completed and the wind farm is been in operation. Any lease condition, which allows the termination of the lease under such circumstances, will create great difficulty for developers seeking to finance projects through loans and will require at least provisions to protect investors. Equally, any clauses which permit termination or restriction of the project as a result of events outside the control of the tenant, will create similar difficulties. Overall it is preferable that leases do not contain such clauses.

In general, the lease should offer the developer as much flexibility as is reasonable in order to encourage consortiums to participate and allow for refinancing, subject to MMS approval. Securing non-recourse project finance for offshore wind farms is a unique activity and leases should encourage innovation within their terms and conditions. This should include the ability to sub-divide leases to allow assignment of interest under the lease with MMS permission.

Lease areas should cover an adequate area for the construction and operation of the wind farm. Conditions which limit the area allowed place unnecessary construction and operation expenses on the developer and have possible impacts on the health and safety of personnel working on the project. Airtricity suggests that the limits on the lease area be agreed between MMS and the developer for each wind project.

In the UK process decommissioning bonds were required by both the lead agency and another agency with the end result that two bonds were required from the developer for the same issue.

Naturally, this places additional and unnecessary financial burdens on the developer with no overall gain for the consenting agencies. Airtricity would urge that overlap issues such as these should be addressed by the MMS as lead agency for permitting wind energy projects on the OCS.

Transmission cables built for the purpose of the wind farm should not be limited solely to exporting power from the project to the shore. A commercial scale wind farm can be connected to the shore by a number of cables to different points along the shore, which presents options to the operator of such cables to participate in trading of wholesale power and work to reinforce the onshore transmission grid.

Equally, it is important that the physical cable is protected by the terms of the lease. Activities which may affect the cable include commercial fishing, dredging, the removal of aggregates and the construction of other works along the cable route. Anything which may damage the cable or limit its operation, reduces the profitability of the project and increases the risk. Provisions to protect the cable, such as a dedicated safety zone, should at least equal those in place to protect oil and gas pipelines.

In general, the lease should encourage developers to finance projects in unique and innovative ways. It is only in this way that the eventual process can be truly competitive. Placing restrictions on the way projects are financed through the provisions of the lease, favors large companies with extensive balance sheets, while discriminating against smaller, more experienced specialist companies, who lack the same financial weight but who can offer unique investment opportunities in a new industry.

**C. Solicit interest for development projects**

Designing and implementing a coherent, streamlined and transparent system for permitting offshore wind farms is the key action that MMS can take to increase, maintain and exploit interest in development projects.

As part of that process, Airtricity recommends that MMS accept pre-qualification expressions of interest in particular sites as soon as possible.

**D. Identify terms and conditions of use such as:**

**Issuance.**

Lease should be issued and accepted within a defined period of time.

Failure to accept and execute leases should result in fines and, eventually, loss of rights. Similarly, failure to develop a site in line with expectations should result in fines/loss of lease to prevent developers sitting on sites.

**Duration**

A lease term of at least 50 years is desirable. The lease for the Arklow bank project is for 99 years and the lease for the Greater Gabbard project is 50 years. In any case the lease should provide an option to re-power the site after 20-25 years. Oil and gas leases can continue indefinitely so long as production continues.

**Assignment of rights**

Airtricity is strongly in favor of the inclusion of assignment rights as it regards this as a crucial element for increasing the options open to developers during the financing of projects. As stated above, it allows for a phased approach to large and unique projects involving a number of partnerships.

**Suspensions and cancellation of rights**

- Insufficient progress at any stage – The Arklow Bank lease contains conditions which require payment of penalty fees for non-achievement of phase completion dates. These penalty fees escalate each year for a number of years after which rights to the parts of the leasehold area involved are forfeited. There is also a provision for application to extend completion dates.

- Non-payment of royalties and other payments – there should be an interest penalty before forfeit of rights.

- Breach of lease conditions – penalties should be designed so as to allow the developer an opportunity to rectify the situation before the suspension and cancellation of rights.

- Lender protection – lenders should receive notice of breaches of conditions and be allowed an additional period to cure the breach.

**Limitation of rights**

Rights should be limited to the development, construction and operation of offshore wind farms. Developer's rights should only be limited during the term of the lease in line with the comments in the previous section.

The rights of third parties over the lease hold area should be carefully limited, particularly in activities which may damage the operation of the wind farm (e.g. mineral extraction, certain types of fishing, etc)

**E. Identify geographical areas of interest for resource and site assessment and for development feasibility:**

A process similar to the Crown Estate would result in developers initially identifying an area of the sea that they have an interest in. The next step would be to acquire approval from MMS to develop in the area identified via an instrument similar to the Crown Estate 'Agreement to Lease' document and finally more detailed site selection, layout and design during the exploration stage.

Site selection is a crucial part of the development process and careful work at this stage can minimize the difficulties encountered during the project and maximize the returns on the project. As such, it is in the developer's best interest to apply their experience and expertise to the task of site selection and to present the results of that process for consideration by the Minerals Management Services. This methodology creates a strong incentive for the developer to select the best possible site with the most chance of success and still allows MMS to permit or deny site locations based on their individual impacts and benefits. It also encourages developers to take into consideration the concerns and wishes of other stakeholders such as local states, coastal management zones, other users of the sea, etc., in order to minimize potential objections to the site.

There is a concern that leasing blocks of sea in a process similar to the existing MMS oil and gas lease sales, will lead to incomplete development of potential sites by imposing artificial boundaries on the site selection process. There are already a significant number of constraints on the site selection process and adding additional and unnecessary administrative constraints could not be regarded as a positive development.

Many states will wish to have an input into the site location of projects near their coast. It is likely that many states will wish to use the provisions of the Coastal Zone Management Act (CZMA) as a vehicle for their involvement in the process, in addition to the permitting and regulation of the elements of the project which are located in state waters or on state land. It is possible that such legitimate state and local involvement would unnecessarily delay the process of permitting renewable energy projects on federal land, either through a lack of sufficient information to make correct decisions or an uncertainty surrounding the impacts of the proposed projects. There are a number of measures that MMS may wish to take to avoid such an occurrence and these would be welcomed by Airtricity. These measures are outlined below:

- Identify generic areas where development will not be encouraged (e.g. within a certain distance from shipping lanes).
- Provide guidance on the acceptable displacement of existing uses by projects.
- Provide states with guidelines on the impacts and benefits of siting renewable energy projects in coastal areas.
- Sponsor transmission line grid studies, which identify areas where there is a high load, coupled with spare grid capacity and possible supply shortages.
- Facilitate ongoing consultation with coastal states to gather their input into the site selection process. Place a reasonable time limit on responses and collate these to inform developers during their site selection exercises.

**F. Ensure fair competition**

Airtricity is in favor of a competitive process that awards concessions based on the experience, financial strength, expertise and the business development plan of the developer, in addition to the excellence of their site selection process and the related suitability of the sea area they have

chosen to tender. Experiences in other markets suggests that this type of process will maximize the number of projects consented and optimize their location to ensure the maximum benefit while minimizing negative impacts.

The process should be open and transparent with clearly defined responsibilities for all participants. The overriding aim should be to ensure the best companies are developing the best sites possible. A program, which allows developers to bid for sites without the expertise, intention or resources to profitably develop those sites, will be considered to have failed in its efforts.

**G. Process permits and applications**

MMS has extensive experience administrating oil and gas leases and Airtricity is confident that the actual mechanics of the process that is eventually decided upon will run efficiently and transparently.

**H. Process pre-application resource assessments.**

Resource assessment for wind farm sites is an expensive undertaking, which requires the erection of a meteorological mast and the use of other monitoring equipment. Many developers will be unwilling to commit to that effort and cost without some level of guarantee that they have initial development rights over the site undergoing investigation. This should include permission to erect a temporary meteorological mast with provision to allow that structure to remain after the lease has been awarded.

**I. Allow concurrent developments**

Concurrent wind development should only be possible in situations where sites will not shelter or otherwise obstruct the wind resource at another site.

It is entirely possible that different types of development (e.g. wind and tidal power extraction) could occur on the same site without compromise to either development. The initial leaseholder should have rights to protect interference with their dependent resource. If developers of different types of project identify the same site, negotiation should be used to determine if both projects are possible.

**J. Minimize multi-use conflicts**

Successful siting of a project should lead to a minimization of the impacts on other uses of the sea, prior to any mitigation efforts. In addition, experience suggests that many existing uses may not be affected at all, for example recreational and fishing uses of the area around the Arklow Bank wind farm continue in the same manner as they did prior to construction.

However, with any development there is the potential for conflict with other maritime users. Minimizing these conflicts is possible through an analysis of the impacts of the development on existing uses and mitigation based on the results. The analysis should be contained in the environmental impact statement and should contain a significant element of stakeholder consultation. The consultation process should start with as broad a focus as possible to ensure all uses of the ocean are considered. An important part of the stakeholder consultation should be to educate stakeholders about the possible impacts – it is very often the case that impacts are exaggerated or not understood and the process of consultation can allay fears among the public and other users of the sea. On the other hand stakeholder consultation will give developers a clearer understanding of possible impacts and benefits of the proposed project.

Conflicts with existing and future uses should also be balanced with the global benefit of renewable energy and the negative impact that the continued use of non-renewable energy has on the environment in general.

## Specific questions:

**2. Possible development scenarios include phased access rights, which would allow for resource and/or site assessments and research prior to securing additional access rights. Rights could be permitted on a case-by-case basis. Development rights would be secured by a competitive process. An alternative would be to require that interested parties secure the access rights to an area prior to conducting assessments and research. Please comment on these possible options.**

Airtricity is in favor of phased development as part of a competitive tender process as outlined in the section on Other Regulatory Regimes.

**3. In cases where applicants or interested parties propose activities that would foreclose competing future uses, how should MMS estimate ''a fair return,'' especially if the competing uses would likely be public uses?**

Wind development uses a small proportion of the seabed and is a temporary development as engineering works can be removed and the site reinstated following use. Extraction of other natural resources can take place after the wind farm has been removed.

Successful site selection and collaboration with stakeholders and potential other users of the site should reduce or eliminate conflict with competing uses. For example, recreational users should not be affected. Commercial fishing may be able to continue in some forms, depending on the site and the type of fishing involved.

In addition, the global benefit of wind farms in terms of $CO_2$ reduction and increased security of supply needs to be balanced against the perceived local disadvantage of the site.

**4. What constitutes a geographical area of interest?**

Assuming phased access rights as described in the section on other regulatory regimes, the investigation stage of wind development would require access to the complete potential site area and cable area to landfall.

The area included in the lease should include the cable area, offshore substation area(s) and turbine area as well as a safety zone around the wind farm.

**5. What assessments should we require prior to competition?**

Please refer to the section dealing with other regulatory regimes, which describes the type of assessments required of developers before and during the Crown Estate process. Airtricity recommends a process that is similar in structure, but takes into consideration the comments on the process included in this document.

**6. How should MMS structure the competitive process and the application process used to issue OCS access rights? Should MMS auction access rights or engage in direct negotiation?**

Please refer to the section dealing with other regulatory regimes, which describes the type of competitive process Airtricity recommends for issuing OCS access rights.

**7. Should MMS take a broad approach to developing a program, or should efforts be targeted to specific regions?**

In line with the recommendations made earlier in this document, Airtricity suggests that the MMS issue guidelines on general areas not suitable for wind farm development, e.g. shipping lanes, and allow developer expertise to lead the site selection exercise. The burden would be on the developer to select sites, which minimize the potential impacts, encourage permitting success and provide an adequate return to both the developer and the government. Narrowing the permitted development areas to sections of the OCS carries a risk of inefficient development of suitable sites that are on the border of the defined areas.

**8. How should MMS consider other existing uses when identifying areas for access?**

Please see answers to Question 7 and comments on allowing developers to select sites for consideration without additional administrative constraints.

**9. How should MMS balance existing uses within an area with potential wind and current energy projects?**

Please refer to the comments on general issues I and J.

**10. Should MMS require permits for collecting data from vessels? Should we consider this information proprietary? What criteria should we use for holding the information proprietary?**

The Crown Estate process permits data collection by and on behalf of developers who have been granted agreements to lease a particular site and Airtricity would like to see a similar process introduced. Some activities, for example the erection of a meteorological mast, may require

permits outside of the remit of the MMS, such as permission from the Army Corps of Engineers under the Rivers and Harbors Act.

Wind measurement data should be proprietary as it is commercially sensitive. Other data should be held until 10 years after the lease is signed and then made available. Data can be made available to federal agencies that require it on a proprietary basis, under strict guidelines. The Crown Estate process included clear guidelines on how data is managed.

**11. What criteria (e.g. environmental considerations, energy needs, economics) should MMS consider in deciding whether or not to approve a project? What criteria should MMS consider for different competing projects (i.e. wind versus current) for the same site?**

The following is a summary of the criteria used by the Crown Estate for project assessment.

- Site location, including wind resource, oceanographic conditions and bathymetry.
- Environmental impacts and benefits, including proximity to conservation areas and presence of birds or marine mammals and aesthetic impacts.
- Developer information including business plan, financial strength, capability and experience.
- Stakeholder considerations, including nature conservation, oil and gas resources, military uses, commercial fisheries or recreational uses.

## Program Area: Environmental Information, Management, and Compliance

**General issues: Please provide information regarding:**

**K. Information requirements needed for environmental management systems for any project.**

Assessing the environmental impacts and benefits of a large project like a commercial scale wind farm requires a great deal of information. The basis of this information is the preliminary environmental assessment, which includes the following information:

1. Site description to include location, bathymetry, weather conditions, etc.
2. Site suitability to include details of how the site was selected over other sites.
3. Wind farm design to include details of the possible foundation designs.
4. Construction, operation and decommissioning details.
5. Potential cable route including available grid connection capacity and risks.
6. Baseline assessment of environmental impacts and risks.

The baseline assessment contents should include at least a description of the current or baseline environmental conditions and determination of possible impacts in the following areas:

- Physical Environment
    - Bathymetry
    - Wind, wave and tidal conditions
    - Geology and geomorphology
    - Sedimentary processes

- Biological Environment
    - Marine ecology
    - Protected habitats
    - Natural fish resources
    - Ornithology
    - Marine mammals
    - Designated areas and inter-tidal habitats
- Human Environment
    - Commercial fisheries
    - Recreational uses
    - Navigation
    - Landscape and visual character
    - Radar
    - Aircraft routes
    - Oil and gas routes
    - Aggregate extraction
    - Marine disposal sites
    - Telecommunications cables
    - Marine Archaeology
    - Tourism

- Military uses

- Socio-economic Environment
  - Economic impacts
  - Cumulative impacts
  - Potential On-Offshore cable route

An Environmental Management System should be implemented for each project. The aim of this system should be to prevent and control impacts by implementing mitigation and monitoring measures as well as ensuring good design and continual iteration between all studies. It should encompass all aspects of the project from engineering design and construction, to operation of the project and should incorporate reviews of development proposals throughout the project. Key elements of the Environmental Management System are a communication plan and an assessment of impacts and risks.

**L. Assessments and studies of risks and impacts (site-specific and cumulative) associated with offshore energy and alternate use projects.**

A risk assessment should be formulated around the following key areas:

- Environmental
- Design
- Construction
- Operation
- Decommissioning

The risk assessment should include information on the risk, the potential consequence and proposed mitigation measures. More detailed risk assessment should be derived from these major key areas as required.

It is admitted that developing, construction and operating a wind farm in a marine environment such as the Outer Continental Shelf is inherently risky. However, experience has shown that through the use of effective mitigation measures, the employment of experienced and diligent personnel and the application of a rigorous Health and Safety policy, there is no risk associated with offshore wind farm development that is insurmountable.

**M. Examples of best practices for environmental compliance, monitoring, and effectiveness being used in the U.S. and elsewhere.**

The British Wind Energy Association has published a number of best practice guidelines in the areas described under General Issue (V).

The Joint Nature Conservation Committee (JNCC) has developed the European Seabirds at Sea (ESAS) survey method which has been used on a number of Irish projects including the Arklow Bank project for the past six years.

Minos (Marine Warmblüter in Nord- und Ostsee) is a German research collaborative which conducts research in the following areas:

- Preferential habitats and migratory routes of animals
- Sense of hearing of porpoises and seals and its sensitivity

**N. Balancing environmental considerations with national energy needs.**

The nation's energy needs have recently become a topic of much concern and debate. Wind farm development offers a method of ensuring indigenous, secure and clean power indefinitely. The benefits for the environment of a reduction in the use of carbon-based fuels have been documented elsewhere in great detail, as have the dangers of continuing to rely on imported fossil fuels for electricity generation. This has all been recognized by Congress when it passed the 2005 Energy Bill, which not only extended the Production Tax Credit (PTC) for the first time in history, but also gave direction to the Department of Interior to commence regulating offshore wind energy projects on the OCS.

It is clear that the production of electricity from sources other than fossil fuels such as oil and gas holds significant benefits for the environment. The environmental impacts of the construction and operation of a particular wind farm are minor in comparison with the overall benefits of such a clean source of energy, particularly given the rigorous environmental standards that companies like Airtricity adhere to.

## Specific questions:

**12. What types and levels of environmental information should MMS require for a project?**

Tenders should contain baseline environmental characteristics and assessment of potential risks and impacts. There should be specific information on the site location, site suitability, wind farm design, construction, operation and design, cost estimates, potential cable route as well as a preliminary assessment of impacts and risks.

During the exploration period, a full Environmental Impact Statement to comply with NEPA and all other federal and state regulations should be prepared. The contents of the EIS should be defined both by these regulations and consultation with concerned stakeholders.

**13. What types of site-specific studies should MMS require? When should these studies be conducted? Who should be responsible for conducting these studies?**

The nature of monitoring studies that are required, varies from site to site. For example, a wind farm proposed near a migratory bird route, may require a particular type of bird monitoring study that another site may not require. Site-specific studies could be carried out by the developer following award of agreement to lease.

**14. What should be the goals and objectives of monitoring, mitigation, and enforcement?**

The following should be the aim of monitoring, mitigation and enforcement:

- Compliance with federal and state regulations
- Prevention or control of impacts
- Reassurance of stakeholder concerns

- Gathering and collating information to inform future developments on the OCS
- Aim for zero negative impacts

**15. What types of impacts are of concern? What are effective approaches for mitigating impacts? How can mitigation effectiveness and compliance with Federal environmental statutes be assessed?**

Impacts of concern tend to be site dependent as are effective approaches for mitigating against them. Effective design and consultation can mitigate against most impacts. Ongoing monitoring can be carried out to reduce uncertainty and help monitor mitigation results.

**16. What regulatory program elements lead to effective enforcement of environmental requirements?**

Airtricity would encourage Minerals Management Services to impose lease conditions associated with strict penalties to enforce ongoing environmental requirements.

**17. How should environmental management systems be monitored (by the applicant, the MMS or by an independent third party)? What should be the MMS roles versus the roles of industry for ensuring appropriate oversight and governance?**

This should be managed by the applicant under the guidance and regulation of MMS.

## Program Area: Operational Activities

### General issues:

**Please provide information on:**

**O. Permitting pilot projects.**

Airtricity has significant experience with offshore pilot projects, having successfully developed and completed the pilot phase of the Arklow Bank offshore wind farm. Wind energy pilot projects are likely to involve small numbers of turbines in challenging locations, new models of higher capacity turbines or demonstrations of new and innovative foundation designs.

Impacts of pilot projects may be lessened by the reduced scale or time period of the installation or by the reduced number of turbine bases compared to commercial projects with more proven technology. The UK is currently considering reducing the permitting burden on developers of new and innovative technologies to encourage their development. This particularly applies to technologies, which utilize wave and tidal power to generate electricity, but may also apply to certain applications of wind technology.

**P. Ensuring human health and safety on and adjacent to the project site.**

Airtricity is proud of its strong record of successfully developing, constructing and operating wind farms in challenging work environments with minimal health and safety incidents. Airtricity's priorities in all activities worldwide and in order of importance are:

1. Safety of people

2. Safety of plant

3. Availability

4. Efficiency

This simple policy forms the basis of Airtricity's health and safety management system, which also includes active risk assessment supported by a strong H&S culture. Safety issues above and beyond those existing on onshore wind farms include, but are not limited to:

- Working over or near water,
- Exposure to salt spray,
- Vessel collisions,
- Sea rescue,
- Recovery or personnel from the water,
- Appropriate access and communication procedures,
- Correct PPE for a marine environment,
- Correct and adequate training for a marine environment,
- Correct maintenance procedures for marine environment.

Unlike oil and gas facilities wind turbines are unmanned and require infrequent visits (maintenance visits can be as infrequent as once a year). The health and safety requirements for such structures therefore do not need to be as stringent as for offshore structures in the oil and gas industry.

The British Wind Energy Association has published Health and Safety guidelines, which contain specific guidance on offshore wind farm development, construction and operation. The BWEA is the industry leader on Health and Safety issues on wind farms, both on and offshore. These guidelines are being adopted by Airtricity and many other developers in the absence of specific and regulatory guidance on certain areas. The guidelines are available on the BWEA website; http://www.bwea.com/.

**Q. Protecting environmental resources during construction, production, and removal.**

Airtricity has a strong reputation for protection of the environment during the development construction and operation of wind farms. The measures required to protect environmental resources largely depend on the individual site design and should be prescribed in the lease conditions. The exact nature of the conditions can be derived from the site specific environmental studies carried out during the permitting process.

Site-specific environmental concerns identified during the EIS process are addressed and/or mitigated during construction and operations. Airtricity maintains continuous dialogue with all project stakeholders, including the statutory permitting agencies and local municipalities and residents to insure compliance with regulatory requirements, minimization of unfavorable environmental impacts and environmental enhancements where appropriate.

**R. Identifying design and installation requirements associated with new projects and modification of existing facilities**

Careful consideration of the wind farm design can have a significant impact on the operational success of the project in the long term. Airtricity firmly believes in planning for operational success at the initial stages of the development and has developed a systematic approach to planning projects that includes the following elements:

- Readiness review
- Planning
- Maintenance readiness
- Operation readiness
- Support readiness
- Life cycle optimization
- Supply chain creation

- Integrated commissioning, system start-up and production ramp-up

The type of installation vessel required during construction and operation of a wind farm varies with the site design and layout. In general, large jack-up type barges are used to transport and install offshore wind turbines. Most of these barges have specifically been designed for this purpose and can carry up to 4 turbine foundations, towers and nacelles.

**S. Identifying production requirements as a component of diligence**

Production levels are dependent on the wind resource available. Efforts can be made to maximize wind power production through careful wind plant layout, turbine design selection, effective maintenance strategies and accurate wind forecasting. Developers of the offshore wind resource will be motivated to ensure that they maximize the return from the resource.

**T. Managing end of life and facility removal.**

There is little industry experience with decommissioning an offshore plant. However, Airtricity recognizes that planned decommissioning of structures placed on the seabed should be considered as part of the permitting process. As such, Airtricity has given decommissioning due consideration during the consent, design, construction and operation stages of each of its offshore projects. The following actions are proposals for decommissioning the Greater Gabbard project in the Thames Estuary, which has received an Agreement to Lease from the Crown Estate.

- Wind turbines – to be removed completely
- Structures and substructures – to be removed to the natural seabed level
- Infield cables – to be either removed (in the event they have not been buried) or to be left safely in-situ, buried to below the natural seabed level or protected by rock dump
- Export cables – to be left safely in-situ, buried to below the natural seabed level or protected by rock dump
- Cable shore landing – to be either safely removed or left in-situ, with particular respect to the natural pattern of long shore drift

- Scour prevention – to be left in-situ
- Onshore cabling – to be either safely removed if above ground or left in-situ if buried
- Onshore grid connection – equipment to be safely removed
- Onshore buildings – to be either converted to alternative uses or removed

Similar provisions exist for the Arklow Bank project. In both cases the decommissioning strategy is based on policies and procedures that currently cover decommissioning of oil and gas facilities.

A decommissioning bond is required by the Crown Estate five years before decommissioning is due to take place, in order to ensure that the developer complies with its obligations and commitments in this regard.

**U. Conducting oversight responsibilities (e.g., inspection, monitoring, enforcement).**

Neither the Crown Estate nor the Irish authorities carry out inspections of sites themselves. They receive regular certified production reports from the operators of the wind farms. Reports detailing the results of the environmental monitoring and mitigation exercises are produced on a regular basis and are issued to the relevant authorities.

**V. Identifying technology assessment and research needs.**

Offshore wind energy is still in relative infancy and there are some information gaps that require applied research. The Option fee required from developers in the Crown Estate permitting process has been used to set up a company called Collaborative Offshore Wind Research Into The Environment (COWRIE). COWRIE's objective is to advance and improve understanding and knowledge of the potential environmental impacts and benefits of offshore wind farm development in UK waters. Its Board of Directors is drawn from The Crown Estate, the Department of Trade and Industry (DTI) and the British Wind Energy Association (BWEA)

COWRIE's research focuses on the following areas:

- Potential effects of electromagnetic fields (EMF) on fish
- Baseline methodologies for aerial and boat based surveys

- The displacement of birds (especially Common Scoter) from benthic feeding areas
- Potential effects of underwater noise and vibration on marine mammals
- An assessment of Remote Techniques

**W. Preventing waste**

The amount of waste and debris that can be expected during construction depends primarily on site and foundation design. Managing construction waste should be included as an element of the Construction Environmental Health and Safety management system, with zero waste being the objective. Systems should be in place for the prevention and recovery of discarded items and materials.

Operational wind plants generate waste primarily in the form of used consumables, such as lubricants, cooling oils, paints. Airtricity's EHS systems include measures to manage this waste, as well as reduce the risk of spillage.

**X. Conserving resources.**

Wind is an infinite natural resource and as such conservation is not a relevant proposition. However there are a number of ways of maximizing the benefits gained from tapping the available resource, such as employing effective layout and design, selecting optimal turbines, employing fast-track development and construction methods, moving efficiently from commissioning to full-scale production and employing effective management and operation systems for the operational wind-farm.

Conservation of other environmental resources is managed through the provisions and mitigation measures developed during the environmental assessment process and generally incorporated in the lease.

## Specific questions:

**18. What options should MMS consider as alternatives to facility removal? Are there unique issues (such as liability) associated with those options?**

A long lease period encourages developers to explore options such as upgrading or replacing turbines with newer technology. Currently offshore turbines range in capacity from 3MW to 5MW although the higher end of this range is currently in a testing phase and not in large-scale production. In the future it is anticipated that turbine capacity will increase beyond this range and sites should be designed with that possibility in mind. Specific provisions include the design of the turbine foundation and the consideration of the overall layout of the wind farm including the spacing between turbines.

**19. What engineering challenges should be considered when operating in an OCS environment?**

The Outer Continental Shelf has the potential to produce a very hazardous environment for operation of plant. Maintenance of plant is made more difficult by the conditions such a marine environment presents. Onshore turbines typically receive 2-4 service calls annually, however offshore turbines need to be designed to receive service calls at a much greater interval, at least once a year. The reason for this lengthy service interval is that access to offshore turbines can be considerably more complicated than access to those onshore. Weather, wave, tidal and current conditions can all affect the ability of service personnel to safely access the turbine.

Unscheduled maintenance calls are likely to occur at irregular but infrequent intervals and provision to reduce the impact on production levels should be included in operational plans. Depending on the nature of the fault requiring unscheduled maintenance, the mobilization of a large number of experienced personnel and specialized vessels with heavy lifting capabilities may be required. The design of the turbine should be influenced by the desire to reduce unscheduled maintenance requirements in addition to increasing the scheduled service intervals to at least one year.

A supply of spare parts should be held by the operator in order to reduce downtime waiting for parts. Many parts should be sourced through local supply chains while others are more specialized and should be supplied by the turbine supplier. Onshore facilities should be made available to hold parts and components near to the departure point of service vessels.

Airtricity would recommend implementation of a Supervisory Control and Data Acquisition (SCADA) system that can electronically report faults in the wind turbines and aid the reduction of time-to-repair and time-of-repair by giving operation and maintenance personnel timely, detailed and accurate information about the fault.

**Other considerations that require particular attention in offshore environments such as the outer continental shelf are lightning protection, maintenance access, communication systems and appropriate rescue and emergency procedures.**

**20. What safety issues exist when operating an energy production facility on the OCS?**

Please see comments under General Issue P.

**21. How should operational activities be monitored (e.g. annual on-site inspections with verification of operating plans)? Is there an appropriate role for the applicant and independent third party certification agents? Describe existing models that could serve as a prototype inspection and monitoring program**

Please see answer under general issue U.

**22. Are there special considerations that MMS should examine in developing an inspection program that covers a diverse set of renewable production facilities? If so, what are they?**

Please see answer under general issue U.

## Program Area: Payments and Revenues

### General Issues

#### Y. Bonus bids

Airtricity is not in favor of bonus bids for offshore renewable energy projects. Such a bidding mechanism would increase upfront capital costs and development risk and would act as a disincentive to early stage project development and exploration. In addition, bonus bids would not assess development competency, anyone, with or without experience, can bid. Schemes like this have generally failed in Europe – for example the AER scheme in Ireland.

It would also require the MMS to define the sites available prior to the bidding process, which is not preferable as outlined in section E. If developers were allowed to propose their own sites, the MMS would have to devise a methodology for dealing with overlapping or contingent projects which took into account the size of the bonus bid for each site yet still selected the best project. Airtricity would prefer to see a project selection method that awarded the best combination of developer and site with concessions, rather than awarding concessions to the developer with the largest cash resource.

#### Z. Rentals

The proposed process will place a significant high risk and financial burden on the developer and as such rental charges prior to the commencement of production, could limit the amount of development that takes place. In addition, with oil and gas development, rental costs are typically incurred during the exploration phase because the developer is physically disrupting the land to "extract" a product (i.e. oil or gas). During the exploration phase of a wind project site, natural resources and land are not disrupted by the developer, so no rentals should be paid during this phase.

#### AA. Royalty terms.

In Airtricity's view, royalties paid to the MMS should be based on the revenue stream, not site acreage. Under such an arrangement, the developer would pay royalties based on wind energy

production. Therefore, if wind energy production is less than expected, the developer will not be forced to pay a fixed sum based on acreage, which would decrease the economic viability of potential projects. In US onshore wind farm projects have seen an escalation of royalties into the production term i.e. lower rates in the early years to enable the developer get over 'teething' problems.

**BB. Fees, including cost recovery fees or other payments.**

No other such fees would be typical for a wind farm development.

**CC. Assessing value/benefits and impacts, Public, Private.**

**DD. Valuing leases, easements or rights-of-way.**

**EE. Comparable fiscal systems.**

MMS should look to the fiscal systems in Europe particularly in Denmark, Germany and Spain which have been successful in encouraging wind farm development offshore. Such regimes have encouraged development by supporting the revenue line thereby increasing a project's profitability and viability e.g. fixed feed in tariffs in Germany. The UK renewable obligation regime should also be reviewed as it has encouraged onshore wind farm development by increasing the revenue line for renewable sources of energy. This regime will encourage the development of UK offshore projects in the future.

**FF. Surety bonds.**

Decommissioning bonds should be in place before construction commences and sufficient to ensure compliance with lease conditions. Abandonment of sites and/or turbines is extremely unlikely and level of surety bonds should reflect that.

## Specific questions:

**23. What should the payment structure be designed to collect? Should payments be targeted at charging for use of the seabed? Should payments try to capture the opportunity costs of other activities displaced by the activity? Should the payment structure be designed to capture a portion of the revenue stream, and if so, under what circumstances?**

Payments should only be charged in relation to the use of the seabed if extraction is taking place, which occurs with oil/gas and not with wind development. The preferred payment structure should be based on a percentage of the revenue stream or a minimum rent (which ever is greater). This is currently the payment structure which is used in the majority of onshore wind farms in the U.S. A similar structure has been used in both the Arklow Bank and Greater Gabbard projects.

Opportunity cost of other activities should also not be an issue. It is unlikely that a wind developer would choose to develop a project over a competing energy resource as it would be impossible to finance unless those competing energy rights were extinguished and to do so would add unnecessary cost to the development.

**24. Offshore renewable energy technologies are in their infancy. Should the payment structure be designed to encourage the development of these activities until the technologies are better established?**

Any incentive scheme should be designed to assist developers to make the upfront capital investment. Wind farm and in particular offshore wind farm development is extremely capital intensive and therefore capital grants or accelerated tax benefits (accelerated tax depreciation) associated with cost can help in reducing the up front capital cost burden.

An incentive scheme should not just be focused on supporting the cost of the investment but should also consider supporting the revenue line. For example the US Federal Tax Incentive for onshore wind farm development (The Production Tax Credit 'PTC') provides tax breaks based on actual production. Developers have found ways to monetize the tax breaks associated with the

'PTC' by either (i) reducing their overall tax bill and/or (ii) passing the PTC to tax paying partners in return for cash. Such an incentive effectively supplements the developers revenue line and improves the profitability associated with a given project.

**25. What methods are used by the renewable energy industry to quantify the risk and uncertainty involved with estimating the size of a renewable energy resource, and evaluating its profitability?**

A great deal of research effort has been focused on this question over the past decade. A good summary of the topic can be found in the paper "*Understanding the Risks associated with financing wind farms"* Peter Raftery et al, presented at the European Wind Energy Conference, Nice, 1999.

The main sources of uncertainty in prediction of energy production from offshore wind farms are:

- Wind speed measurement. Even with offshore meteorological masts, there is significant uncertainty associated with the measurement of wind speed. Compliance with Best Practice standards minimizes these uncertainties;
- It is common to relate site wind measurements to a longer term period using data from a reference station, and uncertainties are introduced through this process;
- Even with a reference station, measurements are typically available for a limited duration, and this period may not be representative of long-term conditions;
- Computational models are typically utilized to predict the variation in wind speed across a site and the energy lost due to turbines operating behind other turbines.
- The natural variability of wind speeds year-to-year.

As a result of the research work conducted, quantification of these uncertainties is possible, giving an overall uncertainty in energy predictions. This is typically considered in the financial modeling to evaluate the risks associated with the predicted returns.

**26. What measures of profitability are commonly used as renewable energy investment decision criteria? How do bonus bids, rents, royalties, fees and other payment methods impact the profitability of these projects?**

The measures of profitability for renewable energy investments are no different to other forms of investments. The two most commonly used valuation tools for assessing a project's profitability are (i) Net Present Value (NPV) and (ii) the Internal Rate of Return (IRR).

A project's NPV is calculated by comparing the initial cost of the project with its discounted future net cash flows. Discounting of future cash flows is a process of converting future cash flows in to a current value by using an assumed interest rate as "a dollar today is worth more than a dollar tomorrow," The interest rate that is normally used is a company's cost of capital. The NPV is an amount that expresses how much value an investment will result in. A project should only be considered if it has a positive NPV.

IRR is based on the same principles of NPV i.e. initial capital cost and discounted future net cash flows. The IRR is the discount rate or break even rate that results in a zero NPV. When IRR is used, the general principle is to select a project whose IRR or break even return exceeds a company's cost of capital.

To summarize the NPV is expressed in money terms where as the IRR is expressed in percentage terms. Both valuation techniques have advantages and disadvantages and are often used together to assess a project's profitability.

Bonus bids would increase the upfront capital cost of a project and therefore would reduce a projects net present value. Depending on the incentive mechanism it is possible to reduce the cost of bonus bids through capital grants or tax breaks. Rents, royalties and other fees increase a projects operating expense line and therefore reduces its revenue and profit line. Again depending on the nature of the incentive it is possible to ease the cost of rents, royalties, etc through reduced levels in the early years of production to help with teething problems or tax breaks

**27. Are there economic models available to calculate the profitability of renewable energy proposals?**

All developers have their own types of proprietary projection models, and these are not made public. There are a number of papers and articles on the topic which the MMS may find useful.

**28. Increased reliance on renewable energy offers both economic and environmental benefits. What are the public benefits to society and do they differ from market driven benefits?**

- Security of supply
- Reducing $CO_2$ emissions
- Reduced cost of electricity
- No oil spills or other pollution incidents.
- Technological innovation
- Employment

**29. In section 8 (p) of the OCSLA as amended by Section 388 of the Energy Policy Act, the Secretary must require the holder of a lease, easement or right of way granted under hat subsection to furnish a surety bond or other form of security. What options should MMS consider to comply with this requirement?**

Surety bonds ensure that a contractor employed by a project owner complies with the terms of a lease, easement or right away etc. MMS could consider requiring a project owner to have certain terms and conditions in a contract with a contractor placing legal obligations on the contractor to comply with required legislation. MMS should work closely with developers in this regard to ensure such suggested legal clauses are not inconsistent with market terms.

## Program area - Coordination and Consultation

### Specific questions

**30. While MMS considers this ANoPR an appropriate start at consultation with interested and affected parties, what other efforts could be undertaken at this early stage of program development?**

Airtricity welcomes this ANoPR as an appropriate and welcome approach to program development. Such detailed consultation early in the rule making process will aid the efficient evolution of the final process and help reduce conflicts between development of America's offshore renewable energy resources and the rules that govern that development. It is hoped this consultation will clarify the scope of the process for the MMS and lead to a process that will encourage development.

At this stage work could begin on gathering sources of geospatial data and other relevant data into a single repository. As suggested in section A the National Atlas represents an ideal model for this data repository.

At this stage it would be appropriate to allow developers to pre-qualify their interest with a short expression of interest document in sites and areas on the Outer Continental Shelf. These expressions of interest could serve as pre-qualification for the permitting process irrespective of it's final form. The advantage is that MMS will gain knowledge of the level of interest in the market, identify potential problems prior to commencement of tendering and focus the attention of all stakeholders.

**31. Should a broad approach be taken to developing a program or should efforts be targeted to specific regions with commensurate coordination and consultation?**

Airtricity feels that it would be appropriate that the MMS develop a program that does not restrict the focus to specific areas. This approach is similar to the approach taken in Round One of the Crown Estate process which has generated a high success rate with many projects built or consented already.

Focusing on specific regions in a process that deals with multiple technologies may prove difficult. Wind, as well as many other renewable technologies, is very dependent on site location in order to ensure a successful project. Attempting to define areas that are suitable for development of all forms of renewable energy under consideration may result in areas with a high suitability for one technology omitted in favor of areas with lower suitability for a variety of technologies. Definition of such areas and avoiding such omissions may prove to be a bigger task then it would initially appear. A more useful approach may be to define the areas that are unsuitable for any development (e.g. shipping lanes and marine sanctuaries) and issue clear guidelines.

**32. Would the establishment of Federal/state cooperatives for targeted areas be useful? Similar to the process for OCS oil and gas program formulation, should we solicit comments on which areas of the OCS should be included or excluded from the program? After establishing where there is consensus in support of program activities, should coordination and consultation efforts be directed to those areas? Conversely, should such efforts be curtailed or abandoned for areas recommended for exclusion?**

Federal-state coordination would be extremely beneficial as would agreements of understanding between the various federal agencies. Both the Irish and the British processes have systems that channel applications through a lead agency which makes the permitting process easier to manage for the developer and allows the lead agency to ensure standards are applied to all projects irrespective of their location. An important part of the success of this approach requires guaranteed response time periods from consulted organizations otherwise a single consultee can delay an entire project through a policy of non-response.

It is preferable to allow developers to determine the optimal sites and put them forward for discussion. However that process could be guided by direction from the CZMA bodies in each state (e.g. NJ report on offshore wind is a valuable tool for site location in that section of the sea) although making this contribution a compulsory part of the process might lead to overall delays.

**33. What are the critical stages (e.g. site evaluation, application, competitive sale) for consultation with affected parties?**

The British Wind Energy Association has printed best practice guidelines for the use of offshore developers and other stakeholders in the process. They are the result of collaboration between a

wide range of participants in the Crown Estate process and outline an approach to consultation in the UK context in great detail.

The guidelines recommend starting consultation as early as possible, preferably during site selection and at least directly after. They recommend that a consultation strategy be formulated that flows from the production of the EIS and the gaining of consents from statutory bodies. Information from the consultation process should be included in the EIS process and vice versa.

**34. Should procedures for consulting with interested and affected parties be codified in the regulations? In general? In detail?**

A list of compulsory or statutory consultees (e.g. U.S. Coastguard, Army Corps of Engineers, etc) could be codified. Each project will have these particular statutory consultees in common but may have different strategic consultees (e.g. Greenpeace) or community consultees (e.g. local sailing clubs). With this in mind it will prove very difficult to codify a consultation process that will be useful but allow for the differences between projects.

A more useful approach might be to request details of consultation strategies in the tender. Lease conditions could then include details of the consultation strategy committed to in the tender.

**35. What processes can MMS use to provide for balance between consultations and the time and burden to the projects?**

Minerals Management Services can take a number of actions to ease the consultation burden on the developer. Some ideas are as follows:

- In line with the “one stop shop” approach suggested above the MMS could facilitate communication between the developers and the participating agencies. This would ensure consultation between developers and agencies involved in the permitting process was as straight forward as possible.
- Enforce reasonable deadlines on consultation responses
- Define scope of consultations with federal and state agencies
- Define a list of statutory consultees for all offshore wind projects.

**36. Are there specific aspects of the new ROW rule issued by the Bureau of Land Management that should be reviewed by MMS for consideration in its rulemaking?**